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POLAR STRATOSPHERIC CLOUD AND OZONE OBSERVATIONS IN NORTHERN FINLAND IN THE WINTER 2002/2003

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In the winter 2002/2003 Arctic stratospheric temperatures were sufficiently cold for polar stratospheric cloud (PSC) formation from late November 2002 to mid- January 2003 and during shorter periods in February and March 2003. Here we report observations of PSCs, stratospheric water vapor and ozone obtained during these events at Sodankylä (67 N, 27 E). Apart from the March 2003 event, PSCs were always detected when indicated by the threshold temperatures. Generally the PSCs of early December 2002 had relatively high backscatter ratios (up to 20 at 940 nm) and higher vertical extension (from 18 to 27 km of altitude) compared to those observed later in the winter. All PSC profiles during the winter indicate the presence of solid particles, whereas the presence of liquid particles was dominating during the cold period in early December. In this winter we did not observe local ice PSCs, however cold pool with possible ice PSCs was located upstream in early December 2002. During this period we detected a small reduction of water vapor at the altitude of 25-26 km. This feature was not repeated by the frost point hygrometer measurements in January 2003 vortex, probably because the vortex became significantly warmer due to strong perturbation by planetary waves after mid-January 2003.